

FCC RF EXPOSURE REPORT

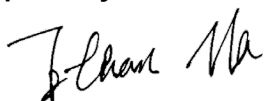
FCC ID: V7TA21

Project No. : 2006C111A
Equipment : AC2100 Dual Band WiFi Range Extender
Brand Name : Tenda
Test Model : A21
Series Model : N/A
Applicant : SHENZHEN TENDA TECHNOLOGY CO.,LTD
Address : 6-8 Floor, Tower E3, No. 1001, Zhongshanyuan Road, Nanshan District, Shenzhen, China. 518052
Manufacturer : SHENZHEN TENDA TECHNOLOGY CO.,LTD
Address : 6-8 Floor, Tower E3, No. 1001, Zhongshanyuan Road, Nanshan District, Shenzhen, China. 518052
Date of Receipt : Aug. 13, 2021
Date of Test : Aug. 28, 2021 ~ Sep. 15, 2021
Issued Date : Oct. 12, 2021
Report Version : R00
Test Sample : Engineering Sample No.: DG2021081325
Standard(s) : FCC Guidelines for Human Exposure IEEE C95.1 & FCC Part 2.1091
FCC Title 47 Part 2.1091, OET Bulletin 65 Supplement C

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.



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TESTING CERT #5123.02

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REPORT ISSUED HISTORY

Report Version	Description	Issued Date
R00	Original Issue	Oct. 12, 2021

1. TEST FACILITY

The test facilities used to collect the test data in this report is at the location of No. 3 Jinshagang 1st Rd. Shixia, Dalang Town, Dongguan City, Guangdong, People's Republic of China.

BTL's Test Firm Registration Number for FCC: 357015

BTL's Designation Number for FCC: CN1240

2. MPE CALCULATION METHOD

Calculation Method of RF Safety Distance:

$$S = \frac{PG}{4\pi^2} = \frac{EIRP}{4\pi^2}$$

where:

S = power density

P = power input to the antenna

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna

For 2.4GHz:

Antenna Specification:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	N/A	N/A	Dipole	N/A	3.4
2	N/A	N/A	Dipole	N/A	3.5

Note:

- 1) This EUT supports CDD, and antenna gains are not equal, so Directional gain=10log $[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N]$ dBi=6.46. So the output power limit is 30-(6.46-6)=29.54, the power spectral density limit is 8-(6.46-6)=7.54.
- 2) Beamforming Gain: 3 dB. Then the Directional Gain=3+3.5=6.5 dB. So the output power limit is 30-(6.5-6)=29.50.
- 3) The antenna gain and beamforming gain are provided by the manufacturer.

Table for Antenna Configuration:

For Non Beamforming:

Operating Mode	TX Mode	1TX	2TX
IEEE 802.11b		V (Ant. 1)	-
IEEE 802.11g		V (Ant. 1)	-
IEEE 802.11n(HT20)		-	V(Ant. 1 + Ant. 2)
IEEE 802.11n(HT40)		-	V(Ant. 1 + Ant. 2)

For Beamforming:

Operating Mode	TX Mode	2TX
IEEE 802.11n(HT20)		V(Ant. 1 + Ant. 2)
IEEE 802.11n(HT40)		V(Ant. 1 + Ant. 2)

Antenna Specification:

For 5GHz:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	Note
1	N/A	N/A	Dipole	N/A	2.7	UNII-1
2	N/A	N/A	Dipole	N/A	3.3	
3	N/A	N/A	Dipole	N/A	3.7	
4	N/A	N/A	Dipole	N/A	3.7	
1	N/A	N/A	Dipole	N/A	3.6	UNII-3
2	N/A	N/A	Dipole	N/A	3.7	
3	N/A	N/A	Dipole	N/A	3.8	
4	N/A	N/A	Dipole	N/A	3.9	

Note:

- 1) This EUT supports CDD, and all antenna gains are not equal. So, the Directional gain= $10\log[(10^{G1/20}+10^{G2/20}+...10^{GN/20})^2/N]$ dBi.
 - a) For UNII-1, the Directional gain = $10\log[(10^{2.7/20}+10^{3.3/20}+10^{3.7/20}+10^{3.7/20})^2/4]=9.38$. So the output power limit is $30-(9.38-6)=26.62$, the power spectral density limit is $17-(9.38-6)=13.62$.
 - b) For UNII-3, the Directional gain= $10\log[(10^{3.6/20}+10^{3.7/20}+10^{3.8/20}+10^{3.9/20})^2/4]=9.77$. So the output power limit is $30-(9.77-6)=26.23$, the power spectral density limit is $30-(9.77-6)=26.23$.
- 2) Beamforming Gain: 6dB.
 - a) For UNII-1: The Directional gain= $6+3.7=9.70$ dB. So the output power limit is $30-(9.70-6)=26.30$.
 - b) For UNII-3: The Directional gain= $6+3.9=9.90$ dB. So the output power limit is $30-(9.90-6)=26.10$.
- 3) The antenna gain and beamforming gain are provided by the manufacturer.

Table for Antenna Configuration:

For Non Beamforming:

Operating Mode TX Mode	1TX	4TX
IEEE 802.11a	V (Ant. 1)	-
IEEE 802.11n (HT20)	-	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11n (HT40)	-	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11ac(VHT20)	-	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11ac(VHT40)	-	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11ac(VHT80)	-	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)

For Beamforming:

Operating Mode	TX Mode	4TX
IEEE 802.11n (HT20)		V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11n (HT40)		V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11ac(VHT20)		V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11ac(VHT40)		V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11ac(VHT80)		V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)

3. TEST RESULTS

For 2.4GHz Non Beamforming:

Directional Gain (dBi)	Directional Gain (numeric)	Max. Average Output Power (dBm)	Max. Average Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
6.46	4.4259	22.93	196.3360	0.17296	1	Complies

For 2.4GHz Beamforming:

Directional Gain (dBi)	Directional Gain (numeric)	Max. Average Output Power (dBm)	Max. Average Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
6.50	4.4668	19.8	95.4993	0.08491	1	Complies

For 5GHz UNII-1 Non Beamforming:

Directional Gain (dBi)	Directional Gain (numeric)	Max. Output Power (dBm)	Max. Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
9.38	8.6696	24.96	313.3286	0.54069	1	Complies

For 5GHz UNII-1 Beamforming:

Directional Gain (dBi)	Directional Gain (numeric)	Max. Output Power (dBm)	Max. Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
9.70	9.3325	24.77	299.9163	0.55712	1	Complies

For 5GHz UNII-3 Non Beamforming:

Directional Gain (dBi)	Directional Gain (numeric)	Max. Output Power (dBm)	Max. Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
9.77	9.4842	25.52	356.4511	0.67290	1	Complies

For 5GHz UNII-3 Beamforming:

Directional Gain (dBi)	Directional Gain (numeric)	Max. Output Power (dBm)	Max. Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
9.90	9.7724	25.33	341.1929	0.66367	1	Complies

For the max simultaneous transmission MPE:

Power Density (S) (mW/cm ²)	Power Density (S) (mW/cm ²)	Total	Limit of Power Density (S) (mW/cm ²)	Test Result
2.4GHz	5GHz			
0.17296	0.67290	0.84586	1	Complies

Note: The calculated distance is 20 cm.

End of Test Report